

Air tightness test of ventilation ducts



“An increase in the need to measure ventilation ducts is foreseeable through more consistent implementation of energy policy objectives and through promotional measures.”

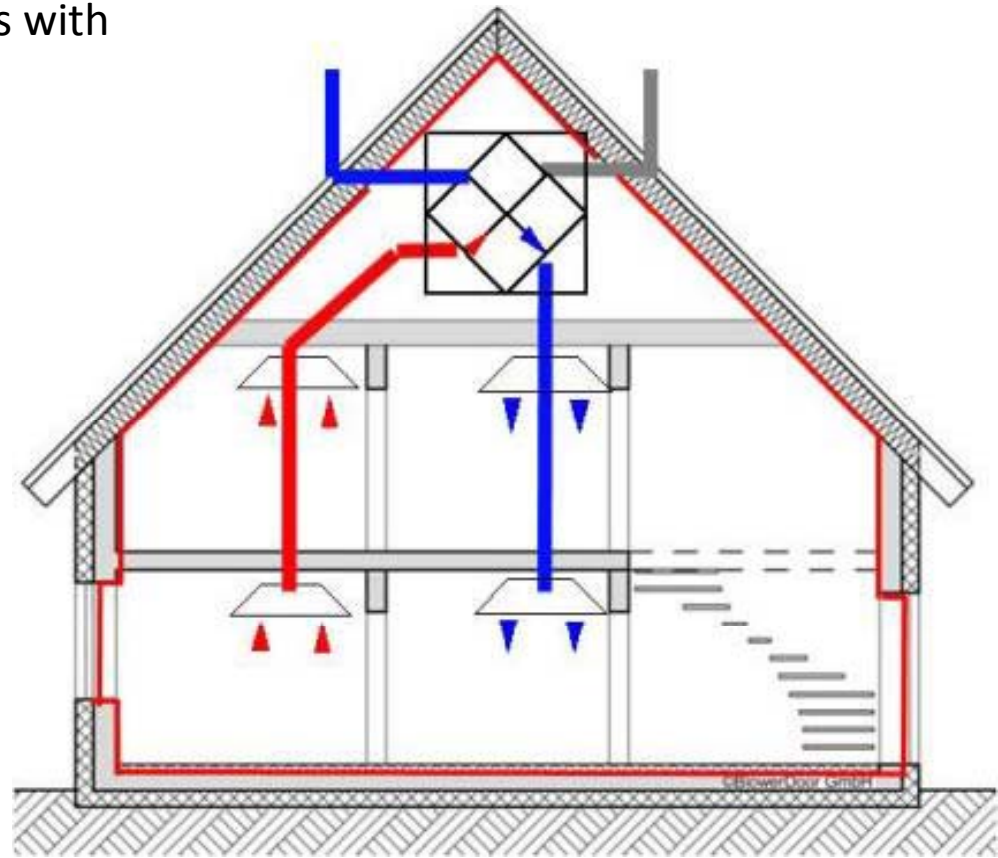
Quotation (translation): Info sheet on air ducts of the FLiB e.V. (Association of Airtightness in Architecture, Germany) in German language.

Definition

A ventilation system is a fan-supported system that automatically supplies indoor rooms with the required fresh air.

Since ventilation systems have become more than pure fresh air suppliers, however, and thus make the desired energy policy goals possible in the first place, more and more sophisticated systems with heat recovery and even systems that can make heating completely superfluous are being developed.

Last but not least, a ventilation system also serves to remove pollutants and prevent the formation of mould.



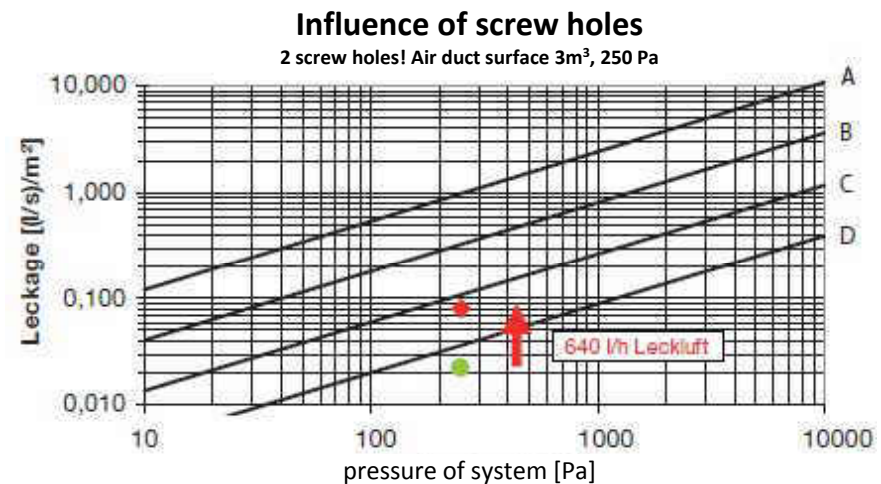
Task

With all the advantages that a ventilation system can bring, there are many aspects to the design and construction of air duct systems that can make the efficient functioning of the ventilation system impossible.

Experienced measurement engineers sometimes smile when discussing which fans are to be used in the ventilation system about decimal places in the efficiency. This is all completely irrelevant if the air duct network is not planned and implemented sufficiently airtight.

Even a single unsealed screw hole with a diameter of only approx. 3 mm can result in a loss of up to 0.32 m³ of air per hour when operating a ventilation system.

According to the standard, however, the permissible leakage area must not exceed 2% of the duct surface. Experience shows, that this leakage area is often more than 15% in reality.




Source: <http://www.bosy-online.de>

Possible consequences of leaking air ducts

➤ Supply and exhaust air systems do not achieve the planned performance

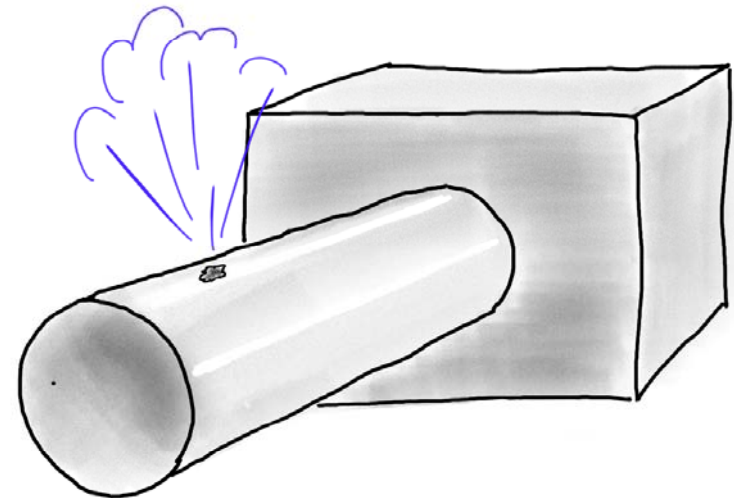
➤ Particles and germs can enter the house via the leakages

➤  Odour nuisance from leaks

➤ Disturbing flow noises may occur



➤ In the event of fire, leaks can contribute to the spread of smoke



Quality assurance during the construction

Analogous to the BlowerDoor test and as required by EN 12599, this leak test should be carried out section by section during the assembly work. Leaks can be detected immediately and usually repaired at low cost, as the ventilation duct system is still accessible. After completion of the building, existing leaks can usually only be found with very great effort and, if this is still possible at all, subsequently eliminated.



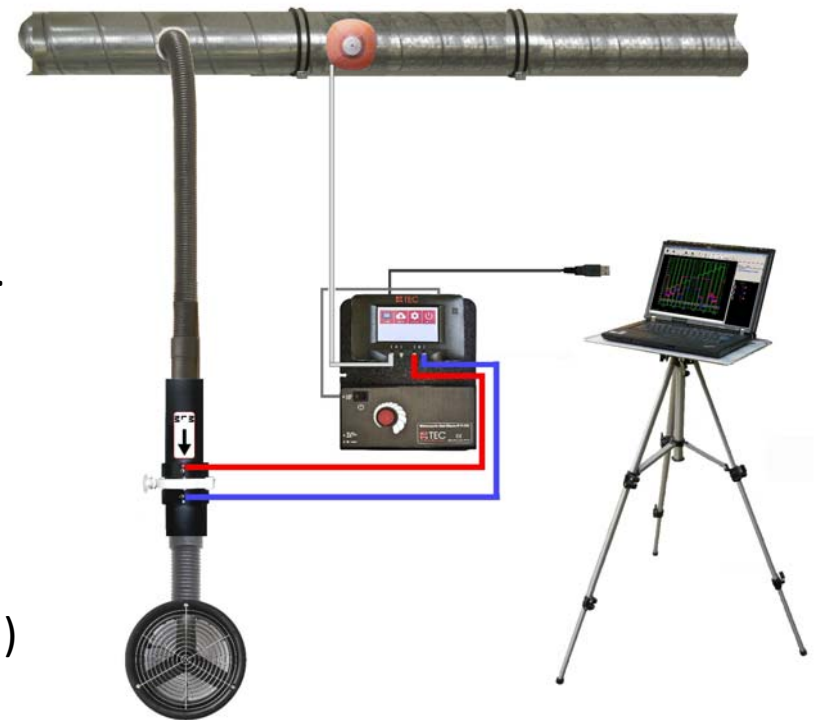
Testing according to EN 12599

When testing the ventilation duct network, the air tightness is checked in accordance with the air tightness classes (A, B, C or D) required in EN 12599.

Ventilation systems are measured by the strand. The Micro Leakage Meter (MLM) is connected to a supply or exhaust air valve of the ventilation strand. All other valves as well as the air duct at the central control unit are sealed with ball bubbles.

With the BlowerDoor MiniFan (DuctBlasterB fan) a negative or positive pressure is generated; with the pressure gauge DG-1000 the pressures are measured at the MLM and the results are documented in the test report.

If there should have been defects during the installation of the ventilation duct network, the air tightness test according to EN 12599 will not be passed!



Standards and directives

EN 12599

Ventilation for buildings – Test procedures and measurement methods to hand over air conditioning and ventilation systems; EN 12599:2012

EN 12237

Ventilation for buildings – Ductwork – Strength and leakage of circular sheet metal ducts; EN 12237:2003

EN 1507

Ventilation for buildings – Sheet metal air ducts with rectangular section - Requirements for strength and leakage; EN 1507:2006

VDI 3803 Blatt 5

Raumlufttechnik, Geräteanforderungen, Wärmerückgewinnungssysteme